

Recommendations for Conserving Fuel in Vehicle Fleets

The average annual fuel use by fleet-based vehicles such as Class 8 trucks, transit buses, and refuse trucks is significantly higher when compared to personal use vehicles such as motorcycles, cars, light-duty vehicles and light trucks. The two factors affecting the average annual fuel use of a vehicle are the average miles driven per year and the fuel economy of the vehicle. Figure 1 shows the average annual fuel use - Gasoline Gallon Equivalent (GGE) - of major vehicle categories in the United States.

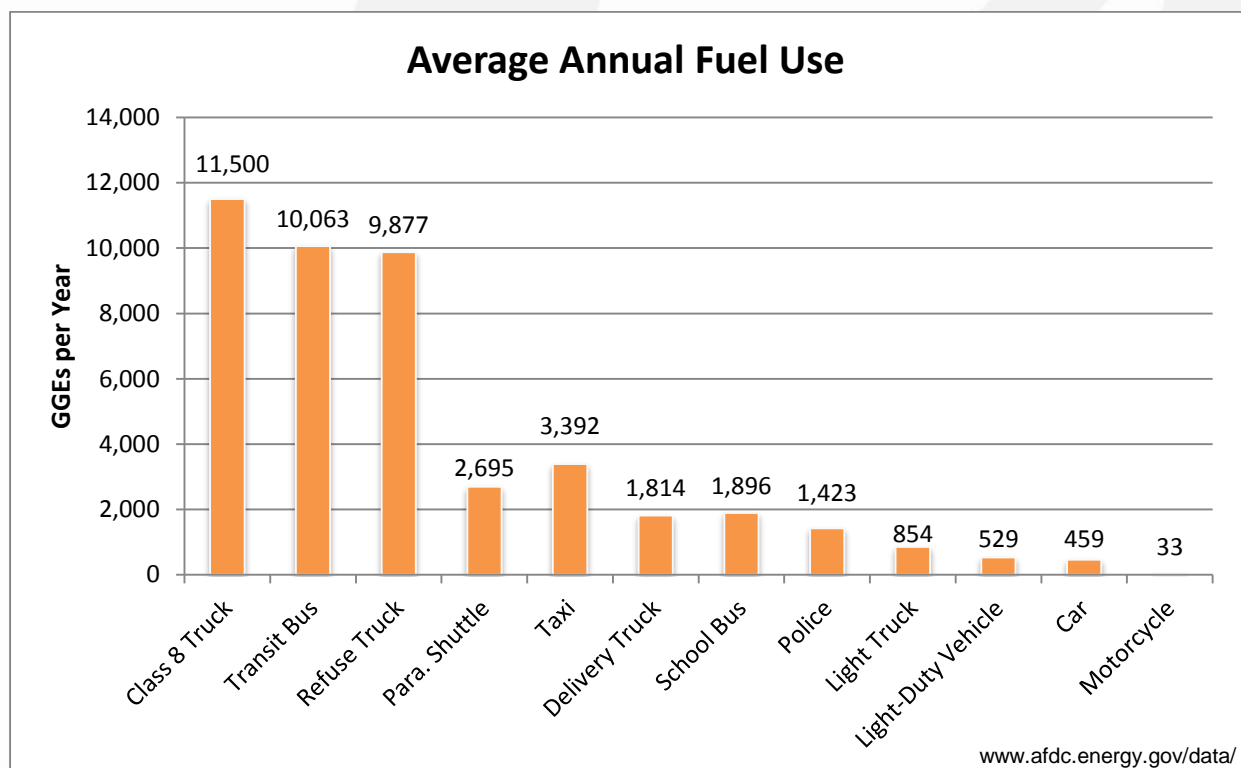


Figure 1. Average Annual Fuel Use by Vehicle Type

Class 8 trucks typically travel longer distances carrying heavy loads and consume more fuel on average than any other vehicle type. Transit buses and refuse trucks also use large quantities of fuel since they have high vehicle miles travelled (VMT) on average and relatively low fuel economy. The last four vehicle types are typically owned by individual consumers, and they each use a fraction of the fuel used by fleet-based vehicles, on a per-vehicle basis. Business and public fleet owners/managers can realize significant environmental and economic benefits by saving fuel and reducing operational costs of fleet vehicles through right-sizing vehicle fleets, purchasing efficient vehicles, driving conservatively, scheduling regular vehicle maintenance, and introducing clean transportation-related technology to their fleet vehicles. These recommendations are discussed in detail below.

Fleet Right-sizing

Right-sizing is the most important factor in good fleet management and can help reduce fleet fuel use and operating costs. Fleet inventories often grow over time to include vehicles that are highly specialized, rarely used, or unsuitable for current applications. By optimizing fleet size and composition, managers not only reduce costs associated with fuel purchases but also other costs such as maintenance cost, insurance, license, and registration cost. To right-size its fleet an agency must (1) compile its vehicle inventory and understand how its vehicles are used (e.g. mileage, purpose, etc.) and (2) analyze the fleets' operational needs, while identifying opportunities to reduce VMT.

A fleet vehicle utilization audit can help identify surplus vehicles and will help in right-sizing the fleet. However, it is important to recognize the requirement for a given vehicle and that it should not be judged solely on its utilization history. Many vehicles like fire-trucks and snow removal trucks are mission-critical regardless of how few miles they travel. Fleet managers often need to define evaluation criteria and rank vehicles to complete right-sizing the fleet.

Make Smart Vehicle Purchases

After right-sizing the fleet, managers are encouraged to replace older vehicles with more fuel-efficient or alternative fuel vehicles. The following purchasing strategies may help fleet managers make decisions that meet operational needs and conserve fuel:

- **Transition to Smaller, More-Efficient Engines:** Using smaller engines and improving horsepower can help fleets meet operational needs without downgrading vehicle class. Some fleets choose to switch from 6-cylinder to 4-cylinder engines to help reduce fuel use and emissions. Hybrids vehicles are also an option and use less fuel when compared to conventional vehicles.
- **Choose Lighter Vehicles:** When purchasing new vehicles, look for opportunities to reduce vehicle weight. Lightweight materials and smaller components can improve fuel economy by up to 2% for every 100 pounds of weight reduced. Also try to avoid unnecessarily large body configurations and heavy accessories.
- **Use Alternative Fuels and Vehicles:** Alternative fuel and fuel-efficient advanced vehicles can reduce or eliminate petroleum use and can be economical options for many fleets. Cost savings from vehicle maintenance, operation, and fuel use typically offset higher purchase prices.

Idle Reduction

Idle reduction describes technologies and practices that reduce the amount of time drivers idle their engines unnecessarily. Drivers idle for a variety of reasons, such as to keep vehicles warm or cool, operate radios, or power equipment. Currently, there are many technologies to help trucks and buses reduce idling time. These include Truck Stop Electrification (TSE) / Electrified Parking Spaces (EPS), Auxiliary Power Units (APUs), cab or bunk heaters, coolant heaters, energy recovery systems, thermal storage, battery-electric air conditioners, automatic engine stop-start controls, and rechargeable battery packs. Reducing idling time has many benefits including reduction in fuel costs, engine wear, emissions and noise, protecting public health and the environment, and increasing U.S. energy security.

Parts and Equipment





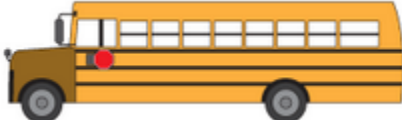
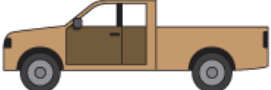

Vehicle fleet managers can conserve fuel and maximize their operational efficiency by outfitting their vehicles with parts and equipment that save fuel. Implementing fuel-efficient strategies such as low rolling resistance tires, replacing traditional dual tires with one super-single tire, and installing aerodynamic equipment, idle reduction equipment, fuel-tracking devices, telematics systems, and speed control modules can also improve fuel economy in fleet vehicles.

Vehicle Maintenance

A comprehensive vehicle maintenance strategy can help fleet managers and drivers conserve fuel. Regular vehicle maintenance practices should include proper tire inflation, using recommended motor oil or energy saving motor oil, and performing recommended engine tune-ups will ensure greater vehicle efficiency.

Clean transportation-related technologies for fleet vehicles that can help reduce fuel usage and greenhouse gas emissions are summarized in Table 1.

Table 1. Clean transportation-related technologies for fleet vehicles

	Fleet Vehicle Type	Technologies for reducing fuel consumption
Class 8 Truck		CNG powertrain, idle reduction technologies, aerodynamic equipment, telematics systems, speed control modules
Transit Bus/Shuttle		Biodiesel, CNG, electric, hybrid powertrains, idle reduction technologies
Refuse Truck		CNG, biodiesel, propane powertrains, telematics systems, idle reduction technologies
Delivery Truck		Biodiesel, CNG, propane, electric, hybrid powertrains, telematics systems, idle reduction technologies
School Bus		Biodiesel, CNG, propane, electric powertrains, idle reduction technologies
Light-Duty Vehicle/Truck		Hybrids, alternative fuels (CNG, biodiesel, electric, propane, E85, hydrogen)
Car and Taxi		Hybrids, alternative fuel (CNG, electric, E85, hydrogen) vehicles

Driving Behavior

Additionally, fleet managers and drivers can improve the efficiency of their vehicles, conserve fuel, save money, and reduce emissions through simple changes in driving behaviors. Research done by the National Renewable Energy Laboratory shows that improvement in driving behaviors can reduce vehicle fuel use by 10%. Significant fuel savings can be obtained through driver training programs, providing feedback to help drivers improve their driving behaviors, offering incentives, implementing policies to set minimum fuel-efficiency targets, slowing acceleration and avoiding unnecessary braking, combining trips, and reducing load on the vehicle

References

1. U.S. Department of Energy, Alternative Fuels Data Center, <http://www.afdc.energy.gov/conserve/> Accessed Oct 31, 2013
2. U.S. Department of Energy, Alternative Fuels Data Center, <http://www.afdc.energy.gov/data/> Accessed Oct 31, 2013
3. Jeffrey Gonder, Matthew Earleywine, Witt Sparks; National Renewable Energy Laboratory, 'Final Report on the Fuel Saving Effectiveness of Various Driver Feedback Approaches'

Other news...

Registration for Spring 2014 Building Operator Certification Class Underway!

The Building Operator Certification (BOC) is a nationally recognized training and certification program that focuses on giving building operators tools to research and pursue efficient operational methods, particularly for HVAC and lighting systems. The Spring 2014 BOC course will begin March 12th, 2014 at the Lansing Community College West Campus. Rebuild Michigan, which is administered by the Michigan Economic Development Corporation, Michigan Energy Office, assists public schools, colleges, universities, local governments, public housing authorities, nonprofits, and small commercial for profit businesses in achieving energy efficiency in their buildings through cost-effective changes. The Michigan Energy Office is currently offering an incentive of up to \$350 for [Rebuild Michigan program participants](#) to earn BOC certification. Substantial utility incentives are also available for those who qualify. Visit www.boccentral.org for information on the Michigan Energy Office and utility BOC incentives, Spring 2014 class schedule, and to register for the class. For more information, contact Karen Wieber at wieberk7@michigan.org or 517-335-3756.

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For more information on this issue of Energy Observer or past issues contact:

Mathew Thomas at thomasm7@michigan.org or call 517-241-8235

Cody Matthews at matthewsc4@michigan.gov or call 517-355-2153



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